

Appln. No. 10/802,139
Amendment dated October 17, 2005
Reply to Office Action of June 17, 2005

Amendments to the Claims:

Please amend claims 1 and 6 and add new claim 7 as follows.
The following listing of claims will replace all prior versions,
and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently Amended). An X-ray diffraction apparatus
in which:

(a) said X-ray diffraction apparatus comprises an incident
optical system, a sample support mechanism, a receiving optical
5 system, and receiving-optical-system rotating means, and an X-ray
emitted from the incident optical system is incident on a sample
supported by the sample support mechanism, and an X-ray
diffracted by the sample is detected by the receiving optical
system;

10 (b) the receiving-optical-system rotating means has a
function to rotate the receiving optical system around a first
axis of rotation for changing an angle which is defined by a
direction of the X-ray incident on the sample and an optical axis
of the receiving optical system;

Appln. No. 10/802,139
Amendment dated October 17, 2005
Reply to Office Action of June 17, 2005

15 (c) the incident optical system includes an X-ray source and
a multilayer-film mirror which has a function to collimate an X-
ray emitted from the X-ray source within a plane perpendicular to
the first axis of rotation;

(d) the sample support mechanism includes attitude
20 controlling means which has a function to switch a condition of
the sample support mechanism from a state maintaining the sample
to have a first attitude in which a normal line of the surface of
the sample is substantially parallel with the first axis of
rotation to another state maintaining the sample to have a second
25 attitude in which the normal line of the surface of the sample is
substantially perpendicular to the first axis of rotation;

(e) the sample support mechanism includes first incident-
angle controlling means which has a function to rotate the sample
around a second axis of rotation which is substantially
30 perpendicular to the first axis of rotation for changing an
incident angle of an X-ray which is emitted from the incident
optical system and is incident on the surface of the sample in
the first attitude; [[and]]

(f) the sample support mechanism includes second incident-
35 angle controlling means which has a function to rotate the sample
around the first axis of rotation for changing the incident angle

Appln. No. 10/802,139
Amendment dated October 17, 2005
Reply to Office Action of June 17, 2005

of an X-ray which is emitted from the incident optical system and is incident on the surface of the sample in the second attitude; and

40 (g) the sample support mechanism includes a mechanism for rotating the sample around two axes of rotation which are orthogonal to each other and pass on the surface of the sample.

Claim 2 (Original). An apparatus according to Claim 1, wherein the attitude controlling means and the first incident-angle controlling means are actualized by a common mechanism.

Claim 3 (Original). An apparatus according to Claim 1, wherein the multilayer-film mirror includes a first reflection surface with a parabolic shape for collimating an X-ray within a first plane perpendicular to the first axis of rotation and a
5 second reflection surface with a parabolic shape for collimating an X-ray on a second plane perpendicular to the first plane.

Claim 4 (Original). An apparatus according to Claim 1, wherein the multilayer-film mirror includes a first reflection surface with a parabolic shape for collimating an X-ray within a first plane perpendicular to the first axis of rotation and a

Appln. No. 10/802,139
Amendment dated October 17, 2005
Reply to Office Action of June 17, 2005

- 5 second reflection surface with an elliptical-arc shape for focusing an X-ray on the sample within a second plane perpendicular to the first plane.

Claim 5 (Original). An apparatus according to Claim 1, wherein the receiving optical system can turn around the second axis of rotation too.

- Claim 6 (Currently Amended). An apparatus according to Claim 1, wherein the sample support mechanism includes a mechanism for moving the sample in a direction perpendicular to the surface of the sample, a mechanism for translating the sample in a two-dimensional direction within a plane parallel with the surface of the sample, ~~a mechanism for rotating the sample around two axes of rotation which are orthogonal to each other and pass on the surface of the sample,~~ and a mechanism for an in-plane rotation of the sample.

Claim 7 (New). An apparatus according to Claim 1, wherein the attitude controlling means includes a curved guide having a circular-arc internal surface and an attitude-change table movable along the internal surface of the curved guide,

Appln. No. 10/802,139
Amendment dated October 17, 2005
Reply to Office Action of June 17, 2005

5 the curved guide has one end which is located at a position higher than the sample and another end which is located at a position lower than the sample, and

a through-hole through which the X-ray can pass is formed in a vicinity of the one end of the curved guide.